

Site Visit Report

Under the European Union (Drinking Water) Regulations 2014 as amended, the Environmental Protection Agency is the supervisory authority in relation to Irish Water and its role in the provision of public water supplies. This Audit was carried out to assess the performance of Irish Water in providing clean and wholesome water to the visited public supply.

The audit process is a sample on a given date of the facility's operation. Where a finding against a particular issue has been reported this should not be construed to mean that this issue is fully addressed.

Water Supply Zone	
Name of Installation	Kinnitty PWS
Organisation	Irish Water
Scheme Code	2500PUB1012
County	Offaly
Site Visit Reference No.	SV26142

Report Detail	
Issue Date	02/12/2022
Prepared By	Lisa Noone

Site Visit Detail			
Date Of Inspection	10/11/2022	Announced	Yes
Time In	11:30	Time Out	13:00
EPA Inspector(s)	Lisa Noone Michelle Roche		
Additional Visitors			
Company Personnel	Irish Water: Andrew Boylan, Joseph Moran, John Gavin Offaly County Council: Michael Carter, Catherine Casey, Joe Coleman, Clodagh Graham		

> Summary of Key Findings

1. The audit found that whilst primary disinfection is being achieved via chlorination, and UV treatment is in place to prevent *Cryptosporidium* entering the supply, further controls are required at Kinnitty Water Treatment Plant (WTP) to ensure that safe drinking water is provided to the public.
2. The audit found a number of shortcomings at the WTP in relation to the calculation of the site's contact time (CT) and the associated alarm set points.
3. In addition, there was a lack of automatic shutdowns for chlorine, UV and turbidity, and no standby UV unit in place in the event of failure of the plant's UV reactor.

> Introduction

Kinnitty Public Water Supply (PWS) serves a population of 453 in Kinnitty, Co. Offaly with approximately 120m³ of treated water being produced at the plant per day. The raw water abstraction is from a single borehole located at Ballyshane Bridge. The treatment at the plant comprises of primary disinfection via chlorination (sodium hypochlorite) in addition to UV treatment for the inactivation of *Cryptosporidium*, with treated water stored on site in a reservoir and distributed to consumers. A pressure booster station for the network is located at Castletown Road.

The audit of Kinnitty WTP was carried out to assess the performance of Irish Water in providing clean and wholesome drinking water.

> Supply Zones Areas Inspected

Ballyshane Bridge borehole was inspected as part of the audit, in addition to all treatment processes on-site.



1. Source Protection

	Answer
1.1	Is the abstraction source(s) adequately protected against contamination? Comment 1. Upon visual inspection of the Ballyshane Bridge borehole, water was observed to be overflowing from the un-capped wellhead and draining to nearby surface waters. The caretaker indicated that this can occasionally occur as a result of raised water table following periods of heavy rain. It was noted by inspectors that the borehole likely has a surface water influence and/or is an artesian groundwater source. 2. It could not be confirmed by Irish Water if the landowners had been formally written to about the presence of a drinking water supply in proximity to their lands and their obligations under the <i>European Union (Good Agricultural Practice for Protection of Waters Regulations) Regulations 2022, as amended</i> .



2. Disinfection

		Answer
2.1	Are duty and standby chlorine pumps/ UV units in operation?	No
Comment		
<p>1. Duty and standby chlorine pumps are in operation at the WTP to achieve primary disinfection.</p> <p>2. The UV unit is utilised as a barrier to <i>Cryptosporidium</i> on site and has been in operation since 2011. There is no standby UV reactor at the WTP should there be a fault with the single UV unit.</p>		

		Answer
2.2	Is there adequate chlorine contact time before the first connection?	No
Comment		
<p>1. The WTP's target chlorine contact time (CT) is 18mg.min/l with effective CT of 21.83mg.min/l achieved with a minimum free chlorine after CT of 0.5 mg/l. The CT calculation does not take into consideration the length of the pipeline/distance between the reservoir where CT is achieved and the first customer (approximately 1km).</p> <p>2. The low-level chlorine alarm at the CT validation point (outlet of the reservoir) is currently set at 0.3mg/l. This does not correlate with the 0.5 mg/l required by the current target chlorine CT calculation</p> <p>3. Chlorine residual trends from the outlet of the reservoir were submitted prior to the audit and all readings were above 0.3 mg/l, however many readings fall below 0.5 mg/l.</p>		



3. Reservoirs and Distribution Networks

	Answer
3.1 Is treated water in tanks and reservoirs suitably protected against contamination?	No
Comment	
Reservoir vents observed during the audit were not protected by a suitable mesh to prevent ingress of animals.	



4. Management and Control

		Answer
4.1	Has the protozoal compliance log treatment requirement been identified for the water treatment plant?	No
Comment		
<p>1. The protozoal compliance log treatment requirement has not been identified for the Water Treatment Plant. Irish Water confirmed that the characterisation of water sources in terms of protozoal log treatment requirement is carried out using a risk-based approach and has yet to extend to many groundwater supplies.</p> <p>2. A barrier to <i>Cryptosporidium</i> and other pathogenic protozoa is provided on site by UV treatment, however further controls are required to ensure adequate protection of human health (see section 2.1 and 4.3).</p>		

		Answer
4.2	Is there a documented alarm response procedure?	Yes
Comment		
<p>Whilst there is a documented alarm response procedure, an emergency contact list was not accessible on site in the event of an incident. Emergency contact numbers are only accessible via the caretaker's mobile phone.</p>		

		Answer
4.3	Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network?	No
Comment		
<p>1. A low chlorine alarm of 0.3 mg/l and a high chlorine alarm of 0.7 mg/l are in place. The low chlorine alarm is not set at a level that protects the chlorine contact time for disinfection and there is no automatic shutdown based on high or low chlorine levels in the final water.</p> <p>2. There are no UV alarms or auto-shutdowns in place should there be a fault with the UV unit or if the unit is operating outside of its validated range.</p> <p>3. The high-level turbidity alarm setpoint at the plant is 1NTU, however there is no automatic plant shutdown linked to final water turbidity.</p>		

Recommendations

Subject	Kinnitty Audit Recommendations (10/11/2022)	Due Date	02/01/2023
Action Text	<p>Recommendations</p> <p>Irish Water is responsible for ensuring a safe and secure supply of drinking water. To address these issues, Irish Water should implement the following recommendations without delay:</p> <ol style="list-style-type: none"> 1. Irish Water should review all alarm and shutdown settings for chlorine, UV and turbidity at Kinnitty WTP, and ensure that appropriate settings are put in place to verify critical treatment processes and validate the UV treatment system. 2. Irish Water should review the contact time for chlorine disinfection to ensure that the effective contact time is achieved and that the first connections are receiving appropriately disinfected drinking water. Irish Water should ensure that the chlorine alarm setpoints are based on the contact time calculations. A calculation of the effective contact time and revised chlorine alarm set points should be submitted to the Agency. 3. Irish Water should ensure that there are duty and standby UV disinfection units with automatic changeover in the event of failure of one of the UV units. 4. Irish Water should liaise with Offaly County Council to ensure that local landowners have been written to in accordance with the <i>European Union (Good Agricultural Practice for Protection of Waters Regulations) Regulations 2022, as amended</i>. 5. Irish Water should ensure that all vents on the reservoir are appropriate and secured against ingress of animals or deliberate introduction of any contaminant or acts of vandalism. 6. Irish Water should ensure that an emergency contact list is accessible at the WTP at all times in the event of an incident. <p>Follow-Up Actions required by Irish Water</p> <p>During the audit, Irish Water representatives were advised of the audit findings and that action must be taken as a priority by Irish Water to address the issues raised.</p> <p>This report has been reviewed and approved by Ruth Barrington, Drinking Water Team Leader.</p> <p>Irish Water should submit a report to the Agency on or before 02/01/2023 detailing how it has dealt with the issues of concern identified during this audit.</p> <p>The report should include details on the action taken and planned to address the various recommendations, including time frame for commencement and completion of any planned work.</p> <p>The EPA also advises that the findings and recommendations from this audit report should, where relevant, be addressed at all other treatment plants operated and managed by Irish Water.</p>		